$\begin{array}{c} 251 \text{ g/o} \\ \text{S/056/61/040/006/011/031} \\ \text{Interaction of conduction electrons} & ... & B111/B201 \\ H = U_1 + H_0 + H_1 + H_2 + H_3, \\ \text{In the form} & \\ U_1 = U_0 + \sum\limits_{k} \left[\epsilon_{k+1} + \epsilon_{k+1} \right] U_{k}^2, \\ H_0 = \sum\limits_{k} \left[\left(\epsilon_{k} \right. u_{k}^2 - \epsilon_{k+1} \right. \left[U_{k}^2 \right) \alpha_{k0}^2 \alpha_{k0} + \left(\epsilon_{k+1} \right. \left[u_{k}^2 - \epsilon_{k1} \right] U_{k}^2 \right) \alpha_{k1}^2 \alpha_{k1} \right] + \sum\limits_{k} \omega_{k} b_{k}^{\dagger} b_{k}. \end{array}$ $\begin{array}{c} H_1 = -\frac{1}{\sqrt{N}} \sum\limits_{k,k'} J \left(u_k v_k \alpha_{k1}^{\dagger} \alpha_{k'1}^{\dagger} - u_{k'} v_k \alpha_{k0} \alpha_{k'0} \right) b_{k'+k+1}^{\dagger} + \text{K.c.}, \\ H_2 = -\frac{1}{\sqrt{N}} \sum\limits_{k,k'} J \left(u_k u_{k'} \alpha_{k1}^{\dagger} \alpha_{k'0}^{\dagger} - v_k v_k \alpha_{k0} \alpha_{k'1} \right) b_{k'+k+1}^{\dagger} + \text{K.c.}, \end{array}$

 $H_{3} = \sum_{h} (\varepsilon_{h1} + \varepsilon_{h+x, 1}) u_{h} v_{h} (\alpha_{h0}^{+} \alpha_{h1}^{+} + \alpha_{h1} \alpha_{h0}).$

If the terms with $\frac{1}{100}$ are put equal to zero, in second approximation an equation can be obtained for compensation:

Card 3/5

3/056/61/040/006/011/031

Interaction of conduction electrons - B111/B201 $\hat{\xi}_{h}u_{h}v_{h} = -\frac{1}{2N}(u_{h}^{2} - v_{h}^{2})\sum_{i}J^{2}u_{h}v_{h} \times$

 $\times \left[\omega_{A-A'+A+X} + \varepsilon_{A+X}, {}_{\downarrow}u_A^2 - \varepsilon_{A\uparrow}v_A^2 + \varepsilon_{A'+X}, {}_{\downarrow}u_{A'}^2 - \varepsilon_{A'\uparrow}v_{A'}^2\right]^{-1},$

PAR 11466

 $2\xi_{h} = \varepsilon_{h\uparrow} + \varepsilon_{h+x,'i} - \frac{1}{N} \sum_{h'} J^{2} (u_{h'}^{2} - v_{h'}^{2}) \times \\ \times [\omega_{\ell-h'+h+x} + \varepsilon_{h+x,i} u_{h}^{2} - \varepsilon_{h\uparrow} v_{h}^{2} + \varepsilon_{h'+x,i} u_{h'}^{2} - \varepsilon_{h'\uparrow} v_{h'}^{2}]^{-1},$ ions,

After some transformations,

 $\xi_{\lambda}u_{\lambda}v_{\lambda}=-\frac{1}{2}(u_{\lambda}^{2}-v_{\lambda}^{2})c_{\lambda}$ (17)

with

 $c_{\lambda} = \frac{1}{N} \sum_{h'} J^{2} u_{h'} v_{h'} \left[\omega_{g-h'+h+x} + \widetilde{\varepsilon}_{h} + \widetilde{\varepsilon}_{h'} \right]^{-1}.$

results. Proof is given that (18) has only the trivial solution ck=0 which is obtained in the normal state. It is thus shown that the interaction of conduction electrons with spin waves in a ferromagnetic material has a repulsive character and cannot give rise to a superconductive state. This result is, in addition, derived from the equality of expressions for the exchange interaction with (a) longitudinal phonons and (b) spin waves. Card 4/5

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S/056/61/040/006/011/031 B111/B201

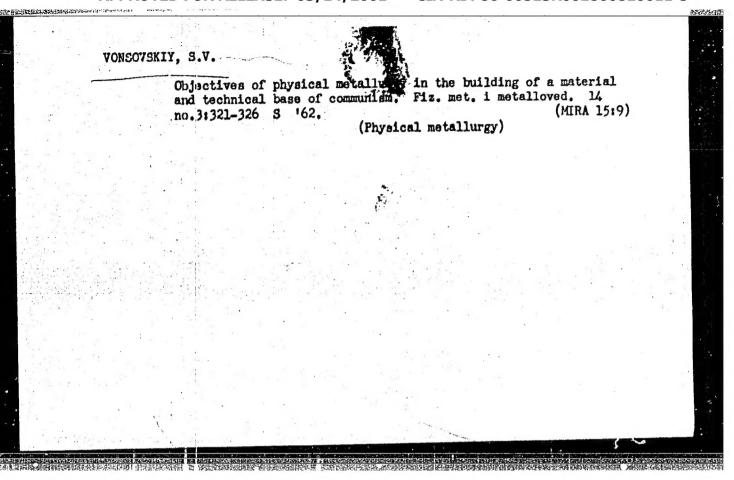
Interaction of conduction electrons

It is finally pointed out that a superconductive state occurs neither on interactions with spin waves, but generally if quasiparticles with integer spin are exchanged. A. I. Akhiyezer and I. Ya. Pomeranchuk are mentioned. There are 1 figure and 10 references: 7 Soviet-bloc and 3 non-Soviet-bloc.

ASSOCIATION: Institut fiziki metallov Akademii nauk SSSR, Chelyabinskiy gosudarstvennyy pedagogicheskiy institut (Institute of Physics of Metals AS USSR, Chelyabinsk State Pedagogical Institute)

SUBMITTED: September 20, 1960

Card .5/5



S/053/62/076/003/002/005 B125/B102		
AUTHOR: Vonsovskiy, S. V.		
TITLE: Magnetism and electrical conductivity of metals	10	
PERIODICAL: Uspekhi fizicheskikh nauk, v. 76, no. 3, 1962, 467-497		
TEXT: On the basis of papers published from 1924 to 1961 a review article is presented on the present stage of the theory of magnetic and electrical properties of metals. There are 6 figures, 2 tables, and 104 references: 48 Soviet and 56 non-Soviet.	15.	
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"APPROVED FOR RELEASE: 03/14/2001 CIA-RI

CIA-RDP86-00513R001860810011-5

s/053/62/077/003/001/002 B101/B144

AUTHORS:

Vonsovskiy, S. V., Izyumov, Yu. A.

TITLE:

Electron theory of transition metals. I

PERIODICAL:

Uspekhi fizicheskikh nauk, v. 77, no. 3, 1962, 377-448

TEXT: A report based upon Western and Soviet publications is given on the present knowledge concerning the electron structure of the atoms of transition metals, on the electron properties of transition metals, the general conceptions of the electron structure of crystals containing atoms of transition metals, and on the band model and s-d(f) exchange model of the crystals of transition metals. Mutual approach of conceptions of the band and s-d models is said to be the next task of further theoretical development. There are 7 figures, alo tables | cand 189 references.

Card 1/1

S/053/62/078/001/001/001 B102/B104

AUTHORS:

Vonsovskiy, S. V., Izyumov, Yu. A.

TITLE:

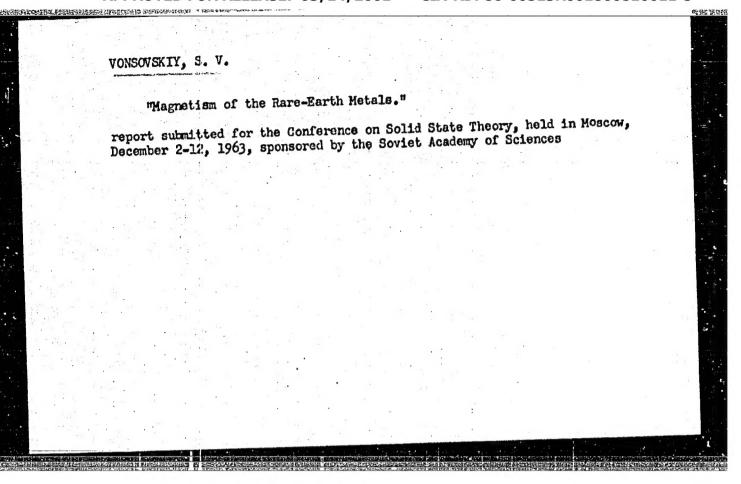
Electron theory of the transition metals. II

PERIODICAL: Uspekhi fizicheskikh nauk, v. 78, no. 1, 1962, 3 - 52

TEXT: This is the second part of a review article, containing chapters III and IV (the first part appeared in UFN, 77(3), 377, 1962). III. Properties of the spin system of a transition metal. (The Hamiltonian of the electron system; spin polarization of the conduction electrons; indirect exchange interaction by electrons of spin-unsaturated layers by conduction electrons; spin wave theory of a ferromagnetic metal; magnetic relaxation and resonance in ferro- and antiferromagnetic metals; slow neutron magnetic scattering in a ferromagnetic metal). IV. The system of conduction electrons in a transition metal. (Conduction electron energy in a ferromagnetic transition metal; effective conduction electron interaction by means of spin waves and its influence on the superconducting state; conditions for the existence of a superconducting state in a ferromagnetic metal; the anomalous electric resistance of a ferromagnetic metal). Finally, the

Card 1/2

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	Electron theory of the tr		S/053/62/078/00 B102/B104		
	advantages and disadvants (Vonsovskiy, ZhETF 16, 98 transition metal physics	11. 10/6) are discus	aaan nnu unsurvey	DIOOTEMP 311	1
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TUROV, Yevgeniy Akimovich: William S.V. otv, red.; MEDER, V.M., red.izd-va; SIMKINA, G.S., tekin. red.

[Physical properties of magnetically ordered crystals; phenomenological theory of spin waves in ferromagnetics, antiferromagnetics, and weak ferromagneties]. Fizicheskie sveistva magnitouporiadochennykh kristallov; fenomenologicheskaia teoriia spinovykh voln v ferromagnetikakh, antiferromagnetikakh i slabykh ferromagnetikakh. Moskva, Izdvo AN SSSR, 1963. 223 p. (MIRA 16:10)

1. Chlen-korrespondetn AN SSSR , Otdel teoreticheskoy fiziki Instituta fiziki metallov AN SSSR (for Vonsovskiy). (Ferromagnetism) (Electromagnetic waves) (Crystallography)

VONSOVSKIY, S.V., red.; SAMSONOVA, V.I., red.; KHOMYAKOV, A.D.,

[Theory of the ferromagnetism of metals and alloys]
Teoriia ferromagnetizma metallov i splavov; sbornik
statei. Moskva, Izd-vo inostr. lit-ry, 1963. 536 p.
Translated from the English. (MIRA 17:3)

1. Chlen-korrospondent AN SSSR (for Vonsovskiy).

5/026/63/000/002/002/007 A004/A126

AUTHOR:

Vonsovskiy, S. V., Corresponding Member of the Academy of Sciences

TITLE:

Modern concepts of magnetism

PERIODICAL: Prircda, no. 2, 1963, 33 - 47

TEXT: After some general remarks and a historical survey on the definition of magnetism and the magnetic properties of microparticles, the author presents a classification of elementary magnets, clucidates the concepts of diamagnetism and paramagnetism, distinguishes between electron and nuclear magnetism, and defines orbital and spin magnetism. He analyzes the effect of the interaction of the atomic carriers of magnetism on magnetic properties and defines ferromagnetism and antiferromagnetism. Concluding, he enumerates the various applications of magnetism in science and technology. There are 20 figures and 2 tables.

ASSOCIATION: Institut fiziki metallov AN SSSR (Institute of Metal Physics of the Academy of Sciences USSR), Sverdlovsk

Card 1/1

S/126/63/015/002/032/033 E039/E435

AUTHORS: Vensovskiy, S.V., Svirskiy, M.S.

TITLE: Or superconductivity in non-uniform ferromagnetics

PERIODICAL: F: zika metallov i metallovedeniye, v.15, no.2, 1903,

3.6-318

TEXT: The theory on the existence of superconductivity in ferromagnetic is discussed together with some related questions. A fully penetrated field is not specially stipulated indether assumptions remain as in Ref. i.d., N. Cooper. Phys. Rev. et'... v. 7. 1902, 307). It is shown to the superconductivity can only occur in ferromagnetics when

$$p < \varepsilon_{o,bos} \sqrt{\frac{1}{2} + \frac{3N\varepsilon F}{2a(p)}}$$
 (8)

where $p=\frac{1}{2}\mu I$, I - energy parameter for s - d or s - f exchange, $\mu=\frac{1}{N_1}\sum_{i=1}^{N_1}s_1^2$, ϵ_0 , bcs - the gap in the energy spectrum of a super-

On superconductivity ...

S/126/63/015/002/032/033 E039/E435

conductor, Ep - the Fermi sphere parameter. From Eq.(8) it is evident that the superconducting condition in ferromagnetics is possible only for sufficiently weak s - d or s - f exchanges. It is concluded that the proposals in Ref.(1) on the type of electron pairing lead not only to an explanation of the "Knight" displacement but also to a positive solution of the question of the existence of superconductive in ferromagnetics and to the constitution of the existence of superconductive in ferromagnetics and to the constitution of the existence of the existence of superconductive in ferromagnetics and to the constitution of the existence of the ex

ASSOCIATIONS: Inutitut fiziki metallov AN SSSR (Institute of

thusics of Metals AS USSR.

SUBMITTED: November 17, 1962

Card 2/2

5/126/63/015/002/033/033 E034/6435

Vonscyskiy, S.V., Svirskiy, M.S.

or Apperconductivity in somuniform paramagnetics and ልተ ምህር ክና

high critica, field alloys

PERIODICAL: Fizika metallov i metallovedeniye, v.lo, no.-.

TEXT: Recent attempts to develop a phenomenological explanation of the high value of the critical magnetic fields for certain The work of L.N.Cooper (Phys.Rev.Lett., v.8, 1952, 367, 1s considered in carticular. Cooper does not show that the energy of superconducting paramagnetics 14 lower than the energy of normal paramagnetics. It is evident that only in this case is it possible to realize a superconducting paramagnetic and hence it is necessary to examine the conditions under which its energy is lower than for both the energy of the nonparameter superconductor and the energy of the normal para-Expressions for these conditions are derived and it magneti:

is shown that (5) $H < \frac{\varepsilon_{0,bcs}}{u}$ Card 1/2

S/126/63/015/002/033/033 On superconductiv: ty ... E039/E435

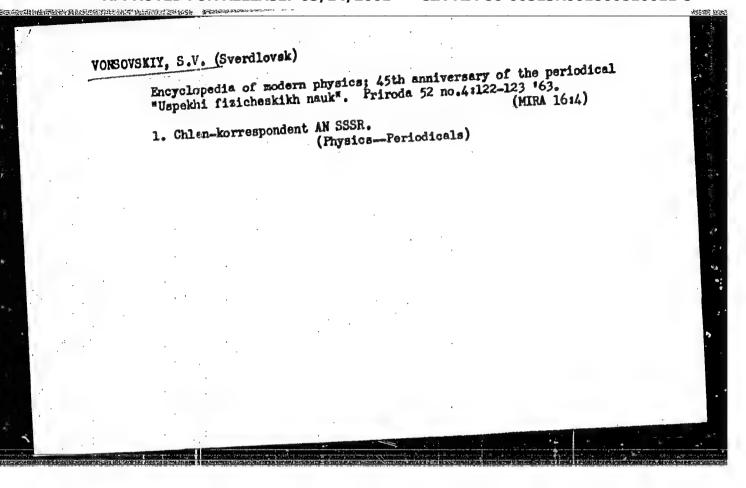
(symbols as given in previous abstract). This inequality (5) shows that when (H) O the condition for a superconducting paramagnetic is ressible only for sufficiently small values of H. Larger values of H destroy the superconducting condition. For values of ϵ_0 bes $\sim 10^{-16}$ Oe and $\mu \sim 10^{-20}$ a value for the critical field $F_{\rm R}$ of not less than 10^4 gauss is obtained. The high values of H found in some alloys is explained on the basis

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ASSOCIATION: Institut fiziki metallov, Chelyabinskiy gosudarstvennyy peda jogicneskiy institut (Institute of Thysics of etc.s. The yabinsk (Itale (edagogic Institute)

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Card 2/2



VONSOVSKIY, 8.V. Magnetism; modern concepts. Priroda 52 no.2:33-47 '63. (MRA 16:2) 1. Institut fiziki metallov AN SSSR, Sverdlovsk; chlem-korrespondent AN SSSR. (Magnetism)

VONSOVSKIY, S.V.

Nuclear methods of investigation in the physics of solid bodies.

Nuclear Methods of investigation in the physics of solid bodies.

Nuclear Mira 16:8)

1. Chlen-korrespondent AN SSSR.

(Solids) (Nuclear physics)

EWT(A) IJP(c) GG L 5337-66 UR/0056/65/049/002/0682/0690 ACCESSION NR: A25021134 yy,g, V.; Svirskiy, M. AUTHOR: Vensoyskiy, 6. TITLE: Theory of s-f exchange for nonvenishing orbital engular momentum SOURCE: Zhurnal eksperimental noy 1 teoreticheskoy fiziki, v. 49, no. 2, 1965, 682-690 TOPIC TAGS: exchange reaction, rare earth element, nuclear shell model, quantum number. superconductivity ABSTRACT: The authors analyze s-f exchange interaction in the case when the total angular momentum J of the f-shell is a good quantum number. The approach used differs from that employed in an earlier paper (ZhETF v. 37, 1354, 1964), where the quantum number J was assumed conserved. The Hamiltonian for s-f exchange connected with changes in J is established and its effects on indirect exchange interaction and on superconductivity are assessed. This Hamiltonian, together with the indirect-exchange Hamiltonian and the conduction-electron interaction Hamiltonian, which are derived on its basis, makes it possible to investigate the distinguishing features of processes accompanied by excitation of the total angular momentum of rare-earth ions. It is shown that excitations of J cannot lead to ferromagnetic ordering of different rare-earth ions, but can influence the occurrence of Card 1/2 0901

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ACCESSION NR: AP502:L134

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ordered states other than ferromagnetic, characterized by superpositions of states with different J. In addition, these excitations of J can contribute to the proper energy of the rare-earth ions. The special behavior effect of Eu impurities on the lowering of the critical superconductivity temperature is explained. The results obtained by R. Brout and H. Suhl (Phys. Rev. Lett. v. 2, 387, 1959) and by C. Herring (Physica v. 24, 3184, 1958) are reviewed critically. Orig. art. has: 23 formulas and 1 table.

ASSOCIATION: Institut fiziki metallov Akademii nauk SSSR (Institute of Metal Physics, Academy of Sciences, SSSR); Chelyabinskiy gosudarstvennyy pedagogicheskiy institut (Chelyabinsk State Pedagogical Institute)

SUBMITTED: 13Ma:65

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OTHER: 017

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ACCESSION NR: AP4023383

5/0048/64/028/003/0423/0429

AUTHOR: Vlasov, K.B.; Volkenshteyn, N.V.; Vonsovskiy, S.V.; Mitsek, A.I.; Turchinskaya, M.I.

TITLE: Unidirectional anisotropy $\sqrt{\rm Report}$, Symposium on Ferromagnetism and Ferroclectricity held in Leningrad 30 May to 5 June 196277

SOURCE: AN SSSR. Izvestiya fizicheskaya, v.28, no.3, 1964, 423-429

TOPIC TAGS: ferromagnetism, antiferromagnetism, cubic lattice ferromagnets, unidirectional anisotropy, nickel manganese alloy

ABSTRACT: A substance is said to possess unidirectional anisotropy (UA) when its magnetic properties differ in the two directions of the same crystallographic axis. This phenomenon was first observed by W.H.Mejklejohn and C.P.Bean (Phys.Rev., 105, 904, 1956), who ascribed its appearance in their material to an exchange interaction across the boundaries between ferromagnetic and antiferromagnetic phases. Two of the present authors have suggested that UA could appear in a single ferromagnetic substance provided a weakly interacting sub-lattice constituting an antiferromagnetic subsystem were present, and they have given a thermodynamic discussion of a unitic subsystem were present, and they have given a thermodynamic discussion of a unitic subsystem.

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ACCESSION NR: AP4023383

axial system of this sort (K.B.Vlasov and A.I.Mitsek, Fizika metallov i metallovedeniye, 14,487,498,1962). In the present paper the theoretical treatment is extended to systems with cubic symmetry. UA is possible when the coupling between the antiferromagnetic vector and the crystal lattice is stronger than the coupling between the ferromagnetic and antiferromagnetic subsystems. The states with UA are metastable and can be altered by application of a magnetic field exceeding the threshold field of the antiferromagnetic subsystem. UA was observed in disordered Ni-Mn alloys (28.1 atomic percent Mn) at temporatures below 20.40K. The magnetization was investigated in the [111] direction, and the UA was evinced by a characteristic bend in the magnetization curve or by a horizontal shift of the hysteresis loop. Samples that were cooled in the presence of a magnetic field showed UA; those that were cooled in the zero field did not. The samples were subjected to an intense pulsed magnetic field (up to 170 kOe) in an effort to alter their UA. At 4.20K a field of 10 kOe appreciably altered the UA of a sample that had been cooled in a field of 1300 Oe, and a field of 130 kOe changed its sign. A sample that was cooled in the absence of a magnetic field and initially showed no UA, acquired UA when subjected to magnetic fields greater than 60 kOe. The degree of UA (as measured by the shift of the hysteresis loop) was a linear function of the field for inducing fields greater than 60 k0e. These fields are of the order of the threshold fields for typ

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	cal cubic antiferromagnetics. The experimental results thus support the hypothesis that the investigated alloys possess both ferromagnetic and antiferromagnetic states. Orig. art. has 14 formulas and 3 figures.	raj
	ASSOCIATION: Institut fiziki metallov Akademii nauk SSSR (Institute of Physics of Metals, Academy of Sciences, SSSR): Ural'skiy gosudarstvenny*y universitet (Ural State University) DATE ACQ: 10Aprôl ENGL: 00	
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ACCESSION NR: AP4037574

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AUTHORS: Vonsovskiy, S. V.; Svirskiy, M. S.

TITLE: Superconductivity of an electron system with singlet or triplet pairs

SOURCE: Zh. eksper. i teor. fiz., v. 46, no. 5, 1964, 1619-1631

TOPIC TAGS: superconductivity, conduction electron, phonon, Coulomb field, ferromagnetism, antiferromagnetism, paramagnetism, exchange force

ABSTRACT: The influence of the type of symmetry of the coordinate part of the wave function of the electron (cooper) pair on the establishment of the superconducting state was investigated in view of the importance of the question of the realization of the superconducting state with singlet or triplet (Cooper) pairs of conduction electrons to problems involving the coexistence of superconductivity

Card 1/4

 ACCESSION NR: AP4037574

with magnetic properties and other questions. It is shown that the type of symmetry of the coordinate part of the wave function of the electron pair manifests itself first of all in the appearance of an "exchange" part of the matrix element, characterizing the transitions of these pairs and having different signs in the singlet and in the triplet states. The exchange parts of the matrix elements characterizing the interaction of the conduction electrons, induced by phonons, Coulomb forces, and also spin waves of a ferromagnet or an antiferromagnet, are determined. The effect of the exchange part of the interaction on the establishment of the superconducting state with singlet or triplet pairs is discussed. In addition, trial wave functions of a superconductor with triplet or triplet pairs corresponding to the Bardeen, Cooper, and Schrieffer method (Phys. Rev. v. 108, 1175, 1957) are constructed and the corresponding variational problem is solved. The manifestations which make it possible to include the triplet pairs in the Bogolyubov method (N. N. Bogolyubov, V. V. Tolmachev, D. V. Shirkov, Movyty metod v teorii averkhprovodi-

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ACCESSION NR: AP4037574

mosti, 1958) and in the method of two-time temperature Green's functions (D. N. Zubarev, UFN v. 71, 71, 1960), are also indicated. It is shown that the presence of the "exchange" part of the matrix element, determining the transitions of the singlet or triplet pairs, is indeed a general property of all the interactions considered above (induced by virtual photons, Coulomb forces, or virtual waves of a ferromagnet or antiferromagnet). In the vicinity of the Fermi surface the character of the interaction described by the exchange part corresponding to the triplet states experiences an abrupt transition from attraction to repulsion for the interaction induced by the phonons and conversely from repulsion to attraction for interactions induced by Coulomb forces or spin waves). The latter can explain the coexistence of superconductivity with ferromagnetism or antiferromagnetism, or else paramagnetism. Orig..art. has: 60 formulas.

ASSOCIATION: Institut fiziki metallov Akademii nauk SSSR (Institute

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ACCESSION NR: AP4037574	en e	•	
of Physics of Metals, Acgosudarstvenny*y pedagogggogical Institute)	ademy of Sciences SSSR); Che icheskiy institut (Chelyabin	elyabinskiy sk State Peda-	
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VONSOVSKIY, S.V.; IZYUMOV, Yu.A.

Theory of sd-exchange interaction in transition metals.
Izv. AN SSSR. Ser. fiz. 28 no. 3:406-411 Mr '64. (MIRA 17:)

1. Institut fiziki metallov AN SSSR.

VLASOV, K.B.; VOLKENSHTEYN, N.V.; VONSOVSKIY, S.V.; MITSEK, A.I.; TURCHINSKAYA, M.I.

The phenomenon of unidirectional anisotropy. Izv. AN SSSR. Ser. fiz. 28 no. 3:423-429 Mr 164. (MIRA 17:5)

1. Institut fiziki metallov AN SSSR i Ural'skiy gosudarstvennyy universitet.

VONSOVSKIY, S. V.1 SVIRSKIY, M.S.

Problem of the coexistence of ferromagnetism and superconductivity. Izv. AN SSSR. Ser. fiz. 28 no. 3:418-422 Mr 164.

(MIRA 17:5)

1. Institut fiziki metallov AN SSSR i Chelyabinskiy gosudarstvennyy pedagogicheskiy institut.

"APPROVED FOR RELEASE: 03/14/2001 CIA-R

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CIA-RDP86-00513R001860810011-5

VONSOVSKIY, S.V.; SVIRSKIY, M.S.

Superconductivity of an electron system with singlet or
triplet pairs. Zhur. eksp. 1 teor. fiz. 46 no.5:1619-1631
(MIRA 17:6)

1. Institut fiziki metallov AN SSSR i Chelyabinskiy gosudarstvennyy pedagogicheskiy institut.

ACCESSION NR: AP4017348

5/0126/64/017/002/0168/0175

AUTHORS: Vonsovskiy, S. V.; Svirskiy, M. S.

TITLE: Effect of conduction electron exchange on ferromagnetic spin ordering in matals

SOURCE: Fizika metallov i metallovedeniye, v. 17, no. 2, 1964, 168-175

TOPIC TAGS: conduction electron exchange, electron polarization, ferromagnetic spin ordering, Hamiltonian, Fermi operator, Green's function, spin-ordered state

ABSTRACT: The effect of conduction electron exchange on electron polarization (satisfied by s-d or s-f exchanges) and on ferromagnetic spin ordering of electrons in the incomplete electronic shells of metallic atoms has been studied analytically. The Hamiltonian of the d and f electrons is written in terms of Fermi operators, and its solution is carried out by introducing the two-dimensional Green's function, limiting it to a first approximation. The energy of the system thus is represented by $\frac{3n}{1+n}\frac{3n}$

where $n_e = \sum \langle n_{e^2} \rangle$. $E_0 = \frac{3}{5} n \zeta_0 + I_0 = 4 \pi e^2 \left(\frac{3n}{8\pi}\right)^{4/6}$

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wo terms on t r s-f of the nterior shell uch ordering.	he right hand sid (J) exchange. The sappears in a months This mechanism	de of the above he third term of ore favorable of of indirect es	e expression ac shows that the energy state th xchange thus ap	at n= n= n/2 a count for the eff spin-ordered stat an in the absence opears to be (1 - a exchange term.	ect s-d s of of-1
ne coefficien	t (1 - \alpha) -1 yie	lds a value of	1.75. Orig. e	ert. has: 40 equa	tions.
the coefficien ASSOCIATION: SSSR);Chelyabi	t (1 - 0) ⁻¹ yie: Institut fiziki :	lds a value of	1.75. Orig. a		tions.
the coefficien ASSOCIATION: SSSR);Chelyabi College)	$t(1-\alpha)^{-1}$ yie. Institut fiziki nskiy gosudarstvo	lds a value of	1.75. Orig. a SR (Institute o itut (Chelyabin	of Physics of Meta sk State Teachers	tions.
the coefficien ASSOCIATION: SSSR);Chelyabi College) SUEMITTED: 14	t (1 - \alpha)^1 yie. Institut fiziki nskiy gosudarstvo	lds a value of metallov AN SSS enny*y pedinst:	1.75. Orig. a SR (Institute o itut (Chelyabin aról	of Physics of Heta sk State Teachers ENC	tions.
the coefficien ASSOCIATION: SSSR);Chelyabi College) SUEMITTED: 14	t (1 - \alpha)^1 yie. Institut fiziki nskiy gosudarstvo	netallov AN SSSenny*y pedinst:	1.75. Orig. a SR (Institute o itut (Chelyabin aról	of Physics of Heta sk State Teachers ENC	tions. ls AN L: 00
the coefficien ASSOCIATION: SSSR);Chelyabi College)	t (1 - \alpha)^1 yie. Institut fiziki nskiy gosudarstvo	netallov AN SSSenny*y pedinst:	1.75. Orig. a SR (Institute o itut (Chelyabin aról	of Physics of Heta sk State Teachers ENC	tions. ls AN L: 00

ACCESSION NR: AP4023382

\$/0048/64/028/003/0416/0422

AUTHOR: Vonsovskiy, S.V.; Svirskiy, M.S.

TITLE: On the problem of existence of ferromagnetism and superconductivity /Report, Symposium on Ferromagnetism and Ferroelectricity held in Leningrad 30 May & June 19637

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v.28, no.3, 1964, 418-422

TOPIC TAGS: ferromagnetism, paramagnetism, superconductivity, electron spin, Bardden-Cooper-Schrieffer theory, superconductivity with forromagnetism

ABSTRACT: The problem of the existence of ferromagnetism and superconductivity is of interest in view of the fact that investigation thereof can yield information of the physical nature of ferromagnetism and superconductivity in metals and thereby serve for further elaboration of the pertinent parts of solid state theory. This problem is intimately bound in with the question of the influence exerted on interaction of conduction electrons by shift of the Fermi momentum surfaces for electrons with different spin components and by exchange of virtual spin waves. The latter factor also obtains in antiferromagnets; hence discussion of it is of added

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ACCESSION NR: AP4023382

interest. There appears to be unanimity of opinion among investigators regarding the role played by the first factor, which was first mentioned in 1958 by the present authors (Doklady AN SSSR, 122, 204, 1958). The second factor is generally agreed to give rise to repulsion of electron pairs in the singlet state and thus hamper or inhibit superconductivity. However, other students report (A. I. Akhiyezer and I. Ya. Pomeranchuk, Zh. eksp. i teor. fiz., 36, 859, 1959 and A. I. Akhiyezer and I. A. Akhiyezer, Ibid., 43, 2208, 1962) that in the triplet state (zero projection of the pair spin) a change occurs in the sign of the matrix elements defining the electron interaction so that an additional attraction favoring establishment of superconductivit appears. Hence it was deemed desirable to consider the question of Cooper pairs in singlet and triplet states in more detail in the framework of the Bardeen-Cooper-Schrieffer-Bogolyubov theory. The question is analyzed in the present paper. Equations are written for the interaction Hamiltonian with operators to distinguish between the singlet and triplet states. Some of the results of the analysis are the following: In a nonhomogeneous ferromagnet superconductivity and ferromagnetism can exist in the case of sufficiently weak sd and sf interaction. The shift of the Fermi momentum surfaces decreases by

Cara T.

a significant factor as compared with the 2p value obtaining in the normal state. Persistance of the reduced shift permits realization of ferromagnetism due to superexchange interaction. In addition, an inequality is derived to evaluate the upper bound of the field H for inequality is a generalization of A. M. Clogston's criterion. (Phys. inequality is a generalization of A. M. Clogston's criterion. (Phys. Rev. Letters, 8, 367, 1962). Orig. art. has: 21 formulas.

ASSOCIATION: Institut fiziki metallov Akademii nruk SSSR (Institute of the Physics of Motals, Academy of Sciences SSSR); Chelyabinskiy gosudarstvennyky pedagogicheskiy institut (Chelyabinsk State Pedagogical Institute)

SUBMITTED: 00

DATE ACQ: 10Apr64

ENCL: 00

SUB CODE: PH

NO REF SOV: 003

OTHER: 005

Card 3/3

5/0048/64/028/003/0406/0411

AUTHOR: Vonsovskiy, S.V.; Izyumov, Yu.A.

TITLE: Contribution to the theory of sd-exchange interaction in transition metals /Report, Symposium on Ferromagnetism and Ferroelectricity held in Leningrad 30 Mcy to 5 June 19637

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v.28, no.3, 1964, 406-411

TOPIC TAGS: electron interaction, sd-exchange interaction, indirect exchange interaction, superexchange interaction, transition metal magnetic moment, transition metal form factor, dilute alloy ferromagnetism, rare earth helicoid structure

ABSTRACT: A unified treatment is given of the following three problems involving interaction between localized and collectivized electrons in transition metals; indirect exchange interaction via the conduction electrons; the magnetic form factor of a transition metal ion; the effective magnetic moment of a transition metal ion. The Dirac operator for the sd-exchange interaction between the conduction and the bound electrons is expressed in the second quantization representation. The indirect exchange interaction is to be obtained from this by eliminating the creation and

Card 1/3

and destruction operators aks and aks for the conduction electrons. This is accomplished approximately by averaging over the grand canonical ensemble. The indirect exchange interaction and the electron spin density are thus expressed in terms of the same correlator (ak's'ak's'), where the brackets indicate the average over the canonical ensemble. The correlator is evaluated by the two dimensional Green's function method of N.N.Bogolyubov and S.V.Tyablikov (Dokl.AN SSSR, 126,53,1959). The integro-differential equation for the two dimensional Green's function is solved by iteration, and a perturbation series is obtained for the correlator. To evaluate the indirect exchange integral, it is assumed (for lack of information to the contrary) that the sd-exchange integral is independent of the momentum transfer. The indirect exchange integral is evaluated in closed form for the case that the conduction band is either thinly or densely populated, so that the free quasiparticle approximation can be employed for electrons or holes. The indirect exchange integral in this case is long range (inverse cube) and oscillatory. Indirect exchange of this type is responsible for ferromagnetism in dilute alloys and for the formation of helicoid structure in rare earth metals. If the conduction band is roughly half filled, the character of the indirect exchange interaction is entirely different, but no general conclusions can be drawn concerning it. The electron spin density about a transi-

ACCESSION NR: AP4023381

tion metal ion, and hence the magnetic form factor and effective spin of the ion, are determined by the same correlator that determines the indirect exchange interaction. Expressions are derived for the effective form factor and spin. With the aid of these formulas, conclusions can be drawn concerning the indirect exchange interaction from measurements of the form factor or the magnetic moment of transition metal ions. Orig.art.has: 26 formulas.

ASSOCIATION: Institut fiziki metallov Akademii nauk SSSR (Institute of Physics of Metals, Academy of Sciences, SSSR)

SUBMITTED: 00 DATE ACQ: 10Apr64 ENCL: 00

SUB CODE; PH NR REF SOV; 005 OTHER; 003

Card 3/3

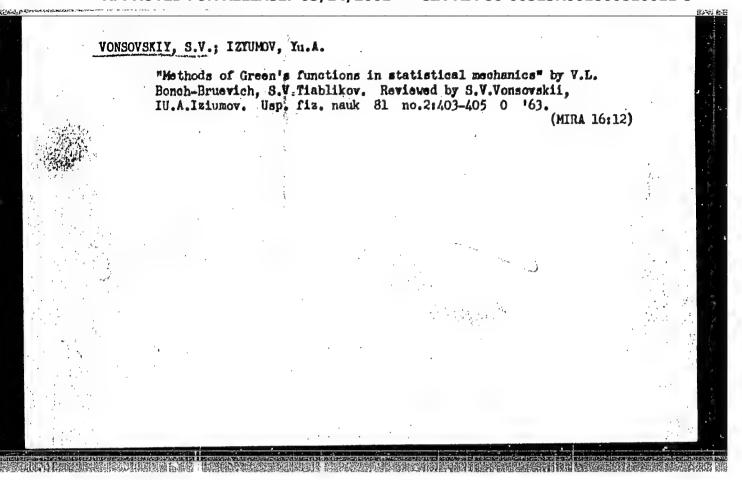
VVEDENSKIY, B.A., glav. red.; VUL, B.M., glav. red.; SHTEYNMAN, R.Ya., zam. glav. red.; BALDIN, A.M., red.; VONSOVSKIY, S.V., red.; GALANIN, M.D., red.; ZERTOV, D.V., red.; ISHLINSKIY, A.Yu., red.; KAPITSA, P.L., red.; KAPTSOV, N.A., red.; KOZODAYEV, M.S., red.; LEVICH, V.G., red.; LOYTSYANSKIY, L.G., red.; LUK'YANOV, S.Yu., red.; MALYSHEV, V.I., red.; MIGULIN, V.V., red.; REBINDER, P.A., red.; SYRKIN, Ya.K., red.; TARG, S.M., red.; TYABLIKOV, S.V., red.; FEYNBERG, Ye.L., red.; KHAYKIN, S.E., red.; SHUBNIKOV, A.V., red.

[Encyclopedic physics dictionary] Fizicheskii entsiklopedicheskii slovar'. Moskva, Sovetskaia Entsiklopediia. Vol.4. 1965. 592 p. (MIRA 18:1)

VONSOVSKIY, Sergey Vasil'yevich; FAYNBOYM, I.B., red.; ATROSHCHENKO, L.Ye., tekhn. red.

[The nature of magnetism] Priroda magnetizma. Moskva, Izdvo "Znanie," 1964. 38 p. (Novoe v zhizzi, nauke, tekhnike. IX Seriia: Fizika, matematika, astronomiia, no.3) (MIRA 17:3)

1. Chlen-korrespondent AN SSSR (for Vonsovskiy).



VONSOVSKIY, S.V.; SVIRSKIY, M.S.

Effect of the exchange of conductivity electrons for a ferromagnetic ordering of spins in metals. Fiz. met. i metalloved. 17 no.2:168-175 F *64. (MIRA 17:2)

1. Institut fiziki metallov AN SSSR i Chelyabinskiy gosudarstvennyy pedagogicheskiy institut.

 I. 31538-66 EVI (m)/EVIP(t)/ETI LJP(c) JD SOURCE CODE: UR/0030/66/000/004/0077/0092

AUTHOR: Vonsovskiy, S. V. (Corresponding member AN SSSR)

ORG: none

TITLE: Physics of magnetic materials 4

SOURCE: AN SSSR. Vestnik, no. 4, 1966, 77-92

TOPIC TAGS: magnetic metal, magnetism, magnetization, magnetic hysteresis, magnetic domain structure, magnetic field, nuclear shell model, ferrite.

ABSTRACT: This is a popular review article dealing with the nature of magnetism and magnetic phenomena, the strengths of magnetic fields existing in nature, the production of strong magnetic fields, interactions of magnetic fields associated with particle production and annihilation, sources of atomic magnetism, magnetism and the nuclear shell model, magnetic ordering in metals and alloys, types of magnetically ordered materials, ferrites, magnetic domain structure, magnetization and hysteresis, classification of magnetic materials from the point of view of their engineering applications (soft and hard magnetics), and various applications of magnetic materials. Numerous references are made to contributions by Soviet scientists to the theory and practice of magnetism. Orig. art. has: 12 figures and 8 formulas.

SUB CODE: 20/

SUBM DATE: 00

"APPROVED FOR RELEASE: 03/14/2001

CIA-RDP86-00513R001860810011-5

L_07105-67 EWT(m)/EWP(t)/ETI IJP(c) JD/JG ACC NRI AP6029097 SOURCE CODE: UR/0048/66/030/006/0906/0914 AUTHOR: Vonsovskiy, S.V.; Irkhin, Yu.P.; Svirskiy, M.S. ORG: Institute of Metal Physics, Academy of Sciences, SSSR (Institut fiziki metallov Akademii nauk SSSR); Chelyabinsk State Pedagogic Institute (Chelyabinskiy gosudarst-PITLE: Exchange interactions in rare earth metals and alloys (Report, All-Union Conference on the Physics of Ferro- and Antiferromagnetism held 2-7 July 1965 in SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 30, no.6, 1966, 906-914 TOPIC TAGS: rare earth metal, electron interaction, exchange interaction, magnetic property, superconductivity, phase transition, mathematic physics ABSTRACT: The authors employ the formalism of second quantization to discuss the exchange interaction between conduction electrons and the electrons in the f shells of the ions of a rare earth motal lattice, and the exchange interaction between the f electrons to which it gives rise. Additional terms to the s-f exchange Hamiltonian of S.N.Liu (Phys. Rev., 121, 451, (1961)) are obtained, which contain operators that change the total angular momentum J of the f-shell electrons by one unit, and the effects of the new terms on magnetic ordering, superconductivity, and phase transitions are discussed. The $J_n^*J_m$ terms in the f-f exchange Hamiltonian obtained in the second order Card 1/2

L 07105-67

ACC NR: AP6029097

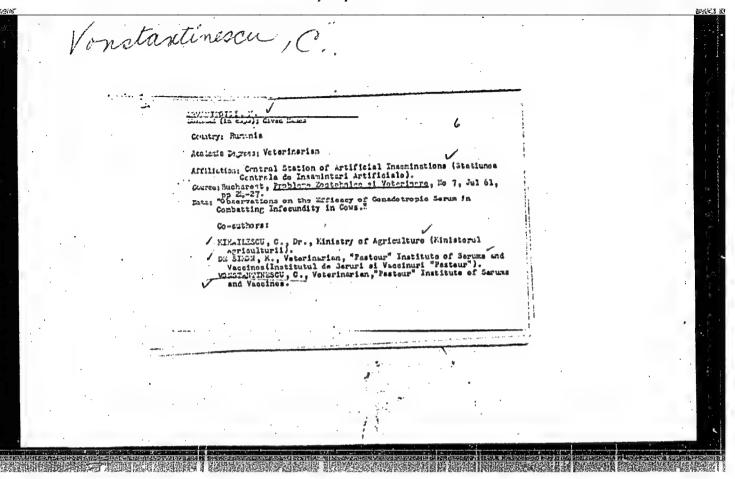
of perturbation theory are independent of energy, the s-f exchange associated with change of J, therefore, cannot lead to long range magnetic order. The new terms in the s-f exchange Hamiltonian lead to interactions between singlet and triplet pairs of conduction electrons. The interaction between singlet pairs is repulsive and results in a reduction of the transition temperature to the superconducting state. The reduction of the transition temperature of La by admixtures of Eu is quantitatively (within 20%) accounted for. The addition of other rare earth metals than Ey, for which $J \neq 0$, only slightly affects the transition temperature. The effect of Eu on the $\gamma - \alpha$ phase transition temperature in Ce is also accounted for. A second, more general, exchange Hamiltonian is expressed with the aid of second quantization operators for groups of electrons in a form involving coefficients that can be evaluated in any particular case by use of the appropriate fractional parentage and 6j coefficients. With the aid of this Hamiltonian one can treat anisotropic effects that arise through participation of the orbital angular momentum of the conduction electron, rather than its spin, in the exchange process. Orig. art. has: 27 formulas.

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SUBM DATE: 00

ORIG. REF: 007 OTH REF:

Card 2/2 fal



VONSYATSKIY, AAT., inzh.; ROYZMAN, I.B., inzh.; KUZNETSOV, S.M., inzh.

Transportation and assemblage of 34.2m reinforced concrets span members. Transp.stroi. 11 no.3121-22 Nr 161. (MIRA 1413)

(Bridge construction)

BERLIN, A.A.; VONSYATSKIY, V.A.; LYUBCHENKO, L.S.

Electron paramagnetic resonance spectra (EPR) of some polynuclear aromatic hydrocarbons. Izv. AN SSSR Ser. khim. no.7:1184-1188
Jl '64. (MIRA 17:8)

٠.

1. Institut khimicheskoy fiziki AN SSSR.

VONSYATSKIY, V.A.; KALYAYEV, G.I.; BERLIN, A.A.

Kinetics of interaction between polyphenylene and 1,1-diphenyl-2picrylhydrazyl. Izv.AN SSSR.Ser.khim. no.2:304-309 F *64.
(MIRA 17:3)

1. Institut khimicheskoy fiziki AN SSSR.

\$/0020/64/154/003/0627/0630

AUTHORS: Berlin. A.A.; Vonsyatskiy, V.A.

TITLE: Induced reactivity of several compounds with conjugated systems on reacting with 1,1-diphenyl-2-picrylhydrazyl

SOURCE: AN SSSR. Doklady*, v. 154, no. 3, 1964, 627-630

TOPIC TAGS: conjugated polymer, paramagnetic polymer, induced reactivity, hydrogen transfer, pi complex, polymer chemistry, polyphenylene, electron paramagnetic resonance, paramagnetic activation, 1,1-diphenyl-2-picrylhydrazyl, paramagnetic induction of

ABSTRACT: The reaction of 1,1-diphenyl-2-picrylhydrazyl (DPPH) with solutions of paramagnetic polymers containing conjugated bond systems (polyphenylene (PF), polyazophenylene, polymethylpyridylacetylene, polyphenylacetytlene, and heat-treated anthracene) and with anthracene monomer, was studied spectrophotometrically and by the EPR. DPPH is not destroyed in solution with anthracene, which is

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not paramagnetic, but is destroyed on addition of PF; its destruction increases with temperature and is dependent on the presence of oxygen. The destruction is associated with the transfer of H from the conjugated system (not from the solvent) to form 1,1-diphenyl-2-picrylhydrazine, but not a DPFH-PF compound. The following reaction mechanism proposed: DFPH dissolves to form solvated complexes, which on addition of PF form a DFPH(PF)solvent pi-complex. Paramagnetic centers of the PF activate the S-T transition of the diamagnetic PF macromolecule, making possible the transfer of the H to the acceptor DFPH. The active PF radical thus formed breaks off an H (or other atom, e.g. halogen) from the solvent molecule in the complex, and the remaining solvent radical reacts with a second molecule of DFPH (or recombines). This mechanism explains the relaction with increasing conjugated bond polymer concentration, and the presence of two low molecular end products. This induction of reactivity by paramagnetic centers of polymers with conjugated bond systems opens the road to new methods in organic and polymer chemis-

Card 2/3

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001860810011-5"

ACCESSION NR: AP4013331

try. "...ebullioscopic measurements were carried out with V.V. Tartarintsev." Orig. art. has: 4 figures and 4 equations.

ASSOCIATION: Institut khimicheskoy fiziki, Akademii nauk SSSR (Institute of Chemical Physics, Academy of Sciences SSSR)

SUBMITTED: 07Aug63

DATE ACQ: 26Feb64

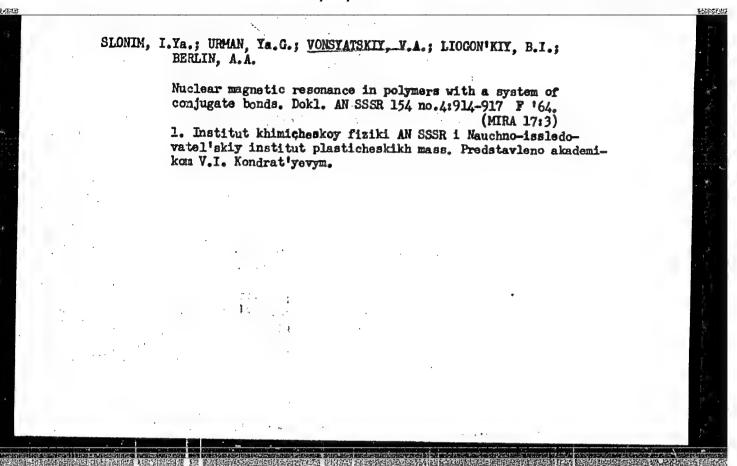
ENCL: 00

SUB CODE: CH

NO REF SOV: 008

OTHER: 003

Card 3/3



VONSYATSKIY, V.A.; ASEYEV, Yu.G.; KASATOCHKIN, V.I.; BERLIN, A.A.

Spectral study of polyphenyleme and its block copolymers with p-diethynylbenzene. Izv. AN SSSR. Ser.khim. no.9:1654-1658 S 163. (MIRA 16:9)

1. Institut khimicheskoy fiziki AN SSSR i Institut goryuchikh iskopayemykh.
(Phenylene group) (Benzene) (Spectrum amalysis)

BERLIN, A.A.; VONSYATSKIY, V.A.; LYUBCHENKO, L.S.

Effect of local activation. Izv.AN SSSR.Otd.khim.nauk no.7:1312 Jl *62. (MIRA 15:7)

1. Institut khimicheskoy fiziki AN SSSR. (Paramagnetic resonance and relaxation) (Macromolecular compounds)

BERLIN, A.A.; VONEYATSKIY, V.A.

Induced reactivity of compounds with conjugate double bonds.

Izv.AN SSSR.Otd.khim.nauk no.7:1312-1313 J1 162. (MIRA 15:7)

1. Institut khimicheskoy fiziki AN SSSR.
(Polymers—Spectra) (Conjugation (Chemistry))

BERLIN, A.A.; VONSYATSKIY, V.A.

Induced reactivity of certain compounds having a conjugate system when interacting with 1,1-diphenyl-2-picrylhydrazyl. Dokl. AN SSSR 154 no. 3:627-630 Ja *64. (MIRA 17:5)

1. Institut khimicheskoy fiziki AN SSSR. Predstavleno akademikom N.N.Semenovym.

SIVERGIN, Yu., nauchnyy sotrudnik; VONSYATSKIY, V., nauchnyy sotrudnik

Simultaneous creation of the material and part. Izobr. 1
rats. no.12:4 '63. (MIRA 17:2)

1. Institut khimicheskoy fiziki AN SSSR.

ZAIKINA, R.G. (Kiyev, ul. Saksaganskogo, d. 83, kv. 1); VONSYATSKIY, V.A. (Kiyev, ul. Chudnovskogo, d. 19, kv. 12)

Distribution of ethylene-substituted phosphoramines in certain tissues and organs of animals. Vop. onk. 4 no.5:557-561 158. (MIRA 12:1)

1. Iz ukrainskogo mauchno-issledovatel'skogo sanitarno-khimicheskogo instituta (dir. - dots. N.I. Luganskiy).

(CYTOTOXIC DAUKS, metabolism

bis (1-aziridiny1)-phenylamine phosphine oxide, distribution in various organs in animals (Rus))

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001860810011-5"

USSR / Forestry. Forest Crops

K-4

Abs Jour: Ref Zhur-Biol., No 13, 1958, 58410

Author : Vopkhvadze, V. M.

Inst : Forest Institute, AS GruzSSR

Title: The peculiarities of the Growth and Dovelopment of Forest Cultivation in the Vicinity of Tbilisi with Respect to SQil Conditions and Methods of

Improvement

Orig Pub: Tr. in-ta lesa, AN GruzSSR, 1957, 7, 115-135

Abstract: The slow growth of forest cultivation in the vicinity of Tbilisi is noted. This area has been cultivated for 60 years. The principla reasons causing the slow progress of planting are described, and the influence of different kinds of soil cul-

Card 1/2

"APPROVED FOR RELEASE: 03/14/2001

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USSR / Forestry. Forest Crops

K-4

Abs Jour: Ref Zhur-Biol., No 13, 1958, 58410

tivation on crops is examined in detail. Agrotechnical advice is given. Advice on the selection of species and their disposition, depending on ecological and forestgrowth conditions of the tertitories to be afforested, are given. The altitude is also to be taken into consideration.

Card 2/2

13

KORNEYEV, K.A.: VONSYATSKIY, V.A.

Synthesis of E-phegy1-E', M', M' M'-disthylentrisgide phosphoric acid labelled by P³². Ukr. khim. zhur. 24 no. 2:226-227 '58.

(MIRA 11:6)

1. Ukrainskiy nouchno-issledovatel'skiy sanitarno-khimicheskiy institut.

(Phosphorus--Isotopes)

(Phosphoramide)

BERLIN, A.A.; VONSYATSKIY, V.A.; LIOGON'KIY, B.I.

Quasiradical block polymerization. Dokl. AN SSSR. 144 no.6:1316-1319 Je *62. (MIRA 15:6)

1. Institut khimicheskoy fiziki Akademii nauk SSSR. Predstavleno akad. V.N.Kondrat'yevym.

(Polymerization)

VON TELEGD, Karoly Roth,

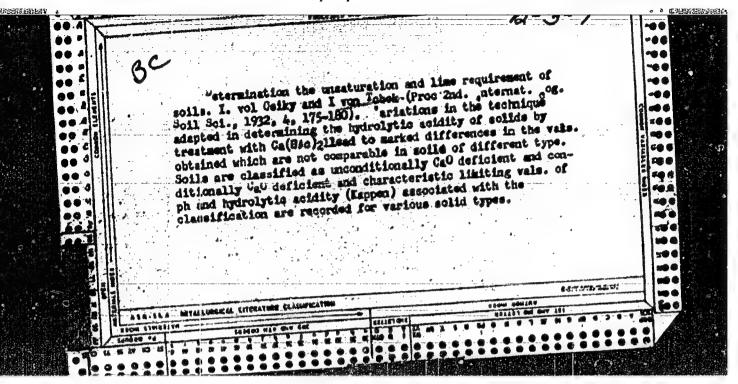
"A kinc stari asvanyolaj es foldgazkutatas es termeles 1935-tol, a mai allapot es a jovo kilatasok," <u>Magvar Banyaszati es Kohaszati Lapok</u>, LXXII, No. 9 (1939), 189-200.

So: Nat. Committee for a Free Europe. Mid-European Studies Center. The Hungarian Oil Industry, New York, 1954, Unclassified.

VOE TSIVED, Karoly Roth

Mercerora of Sections is (Despect: Secular, 1929)

SCI List, Soundates for a Free Europe. Fid-European Studies Conter. The European Cil In Sustry, Res York, 1954, Unclassified

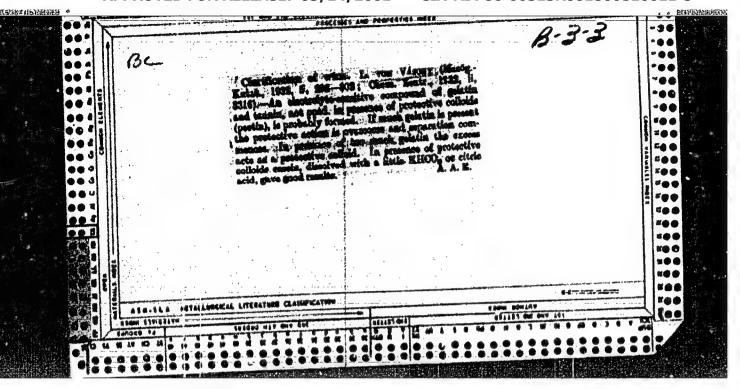


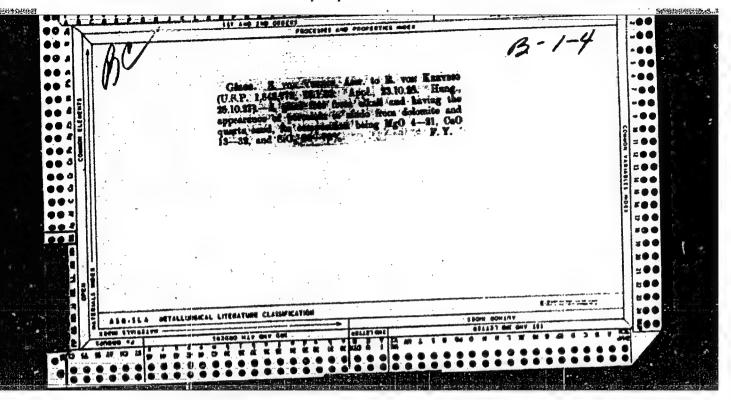
VORTOR, A.

"Inclined shaft skips in coal mines."
Uhli, Praha, Vol 4, No 1, Jan. 1954, p. 19

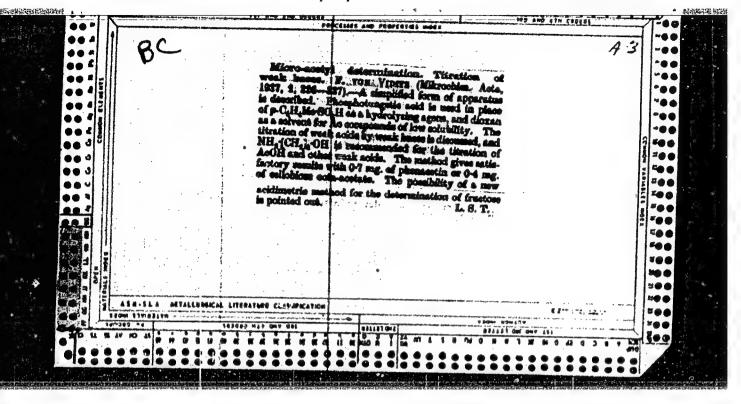
SO: Fastern European Accessions List, Vol 3, No 10, Oct 1954, Lib. of Congress

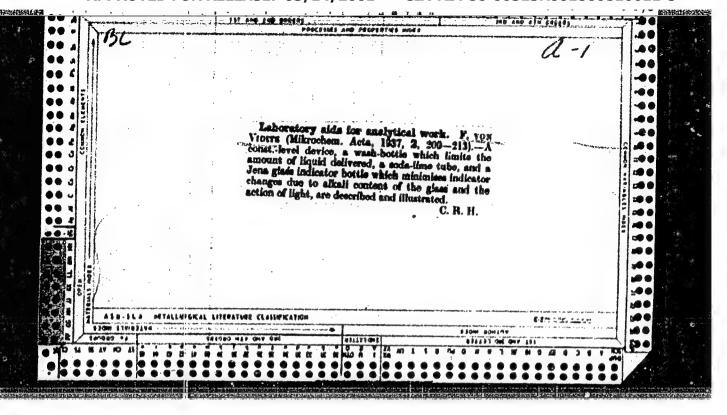
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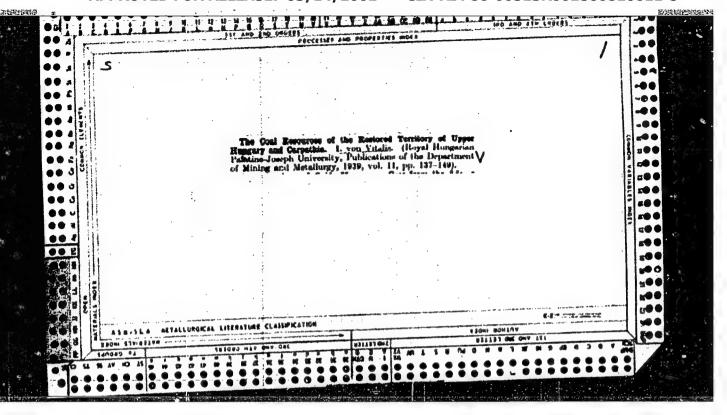


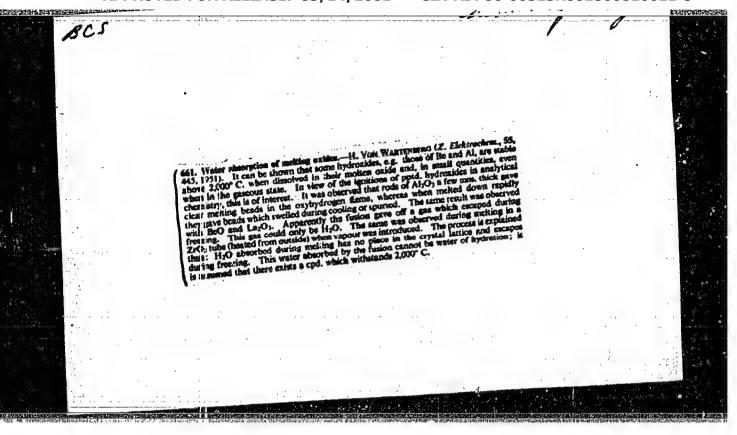


"APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001860810011-5









Wicroscopical examination of the living nervous system." (p. 310) by Vonwiller, F.

SO: Advanced in Contemporary Biology (Usrekhi Sovremennoi Biologie) Vol. VI, No. 2 1937

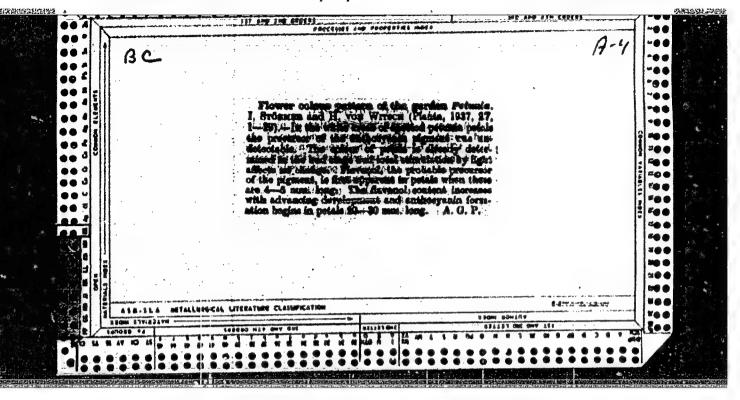
"The Electron Microscope" (p. 535) by Vonwiller, P.

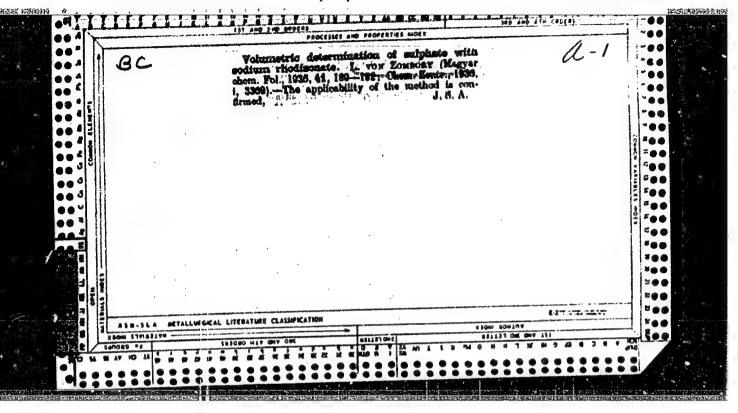
SO: Advances in Modern Biology, (Uspekhi Sovremennoi Biologii), Vol. X, No. 3, 1939

WOMWILLER, P.

"Fourth International Congress of Experimental cytology." (p. 362) by Vomviller, P.

SO: Advanced in Contemporary Biology (Uspekhi Sovremennoi Biologie) Vol. VI, No. 2 1937





AP7001464 (N)

SOURCE CODE: HU/0038/66/003/011/0342/0344

AUTHOR: Voo, Endre (Graduate chemical engineer)

ORG: Industrial Research Institute for Synthetic Materials, Budapest (Muanyagi-pari Kutato Intezet)

TITLE: Industrial application of unsaturated polyester resins Preparation of master molds

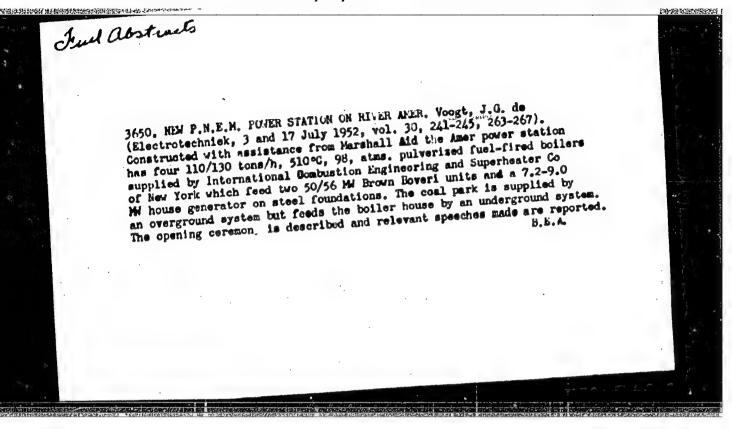
SOURCE: Muanyag es gumi, v. 3, no. 11, 1966, 342-344

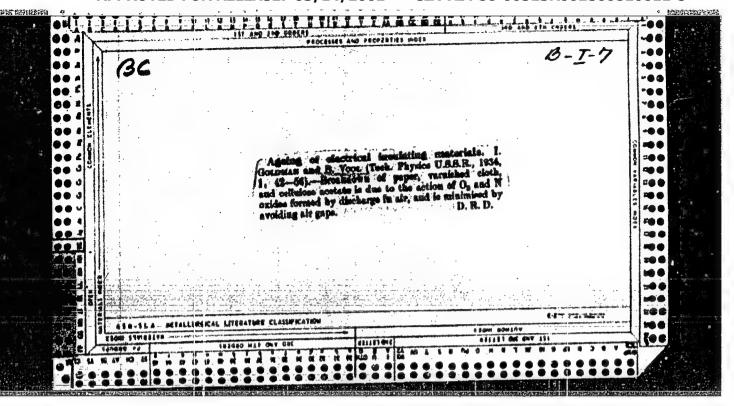
TOPIC TAGS: unsaturated polyester resin, shipbuilding engineering, shipbuilding

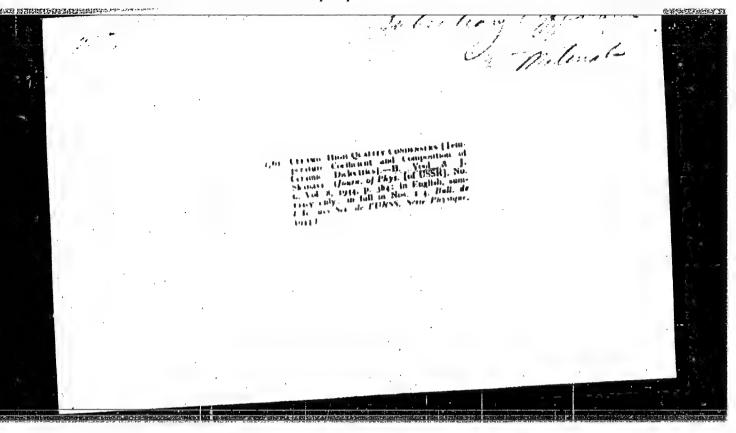
ABSTRACT: The use of unsaturated polyester resin to make master molds, described and demonstrated by an example, was developed in cooperation with the Gheorghiu Dej Shipyard (now the Hungarian Ship and Crane Works, Angyalfold). The technical and economic advantages and drawbacks of this process are presented by calculations. It was found that the making of even complex and bulky molds from resins was economical and that their characteristics were preferable to those of conventional molds. Orig. art. has: 5 figures. [Based on author's abstract]

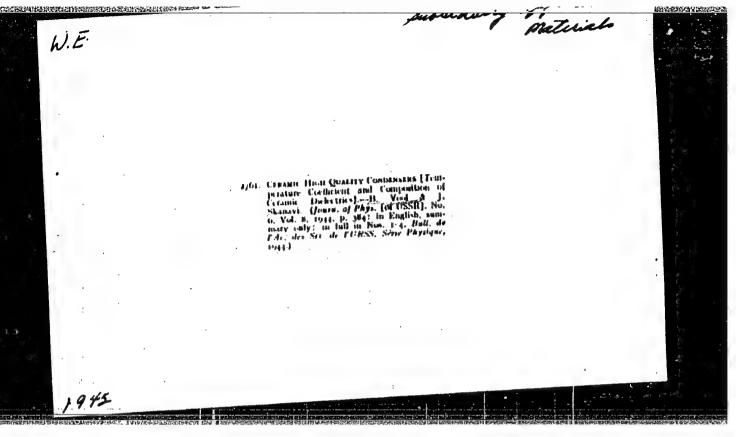
SUB CODE: 11, 13/SUBM DATE: none/ORIG REF: 002/

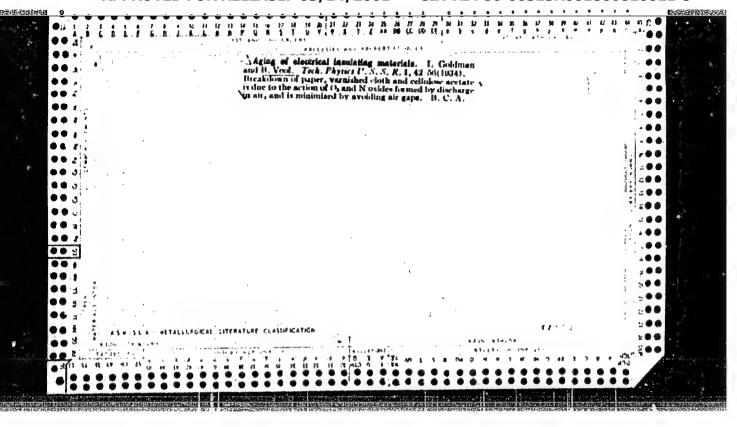
[KS]

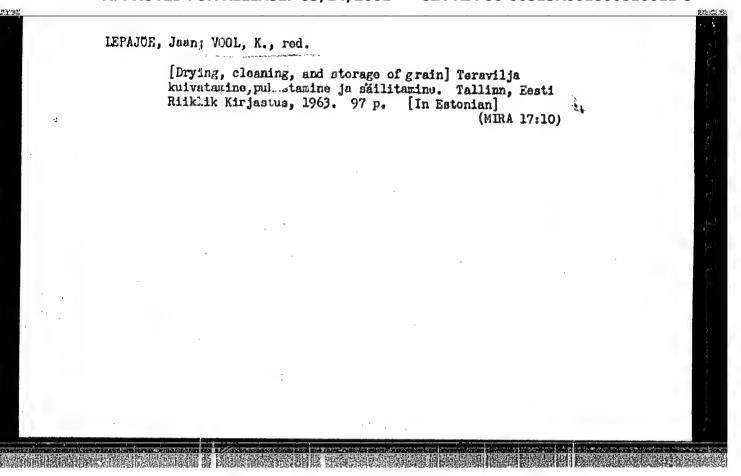












SEPP, Jam; VOOL, K., red.

[Correspondence between wages and the efficiency of labor in the agriculture of the Estonian S.S.R.] Töötasu vasavusest tööviljakusele Eesti NSV põllumajanduses. Tallinn, Eesti Riiklik Kirjastus, 1963. 100 p. [In Estonian]

(MIRA 17:6)

VIPPER, Heinrich; VOOL, K., red.; EINBERG, K., tekhn. red.

[Annual lupines] Üheaastased lupiinid. Tallinn, Eesti
Riiklik Kirjastus, 1962. 188 p. (MIRA 16:12)

(Lupines)

TEITEL'BAUM, Viktor; VOOL, K., red.; PEDARI, J., tekhn. red.

[Problems in the development of vegetable growing in the Estonian S.S.R.]Koogiviljakasvatuse arendamise kusimusi Eesti NSV-s. Tallinn, Eesti Riiklik Kirjastus, 1961. 32 p. (MIRA 16:1)

(Estonia—Vegetable gardening)

IEETOJA, Rihard; VOOL, K., red.; IUMET, E., tekhin. red.

[Vegetable growing in greenhouses] Koogivilja kasvatamine katmikalal. Tallinn, Eesti riiklik kirjastus, 1961. 383 p.

(MIRA 15:5)

(Estonia—Vegetable gardening)

(Greenhouse management)

"APPROVED FOR RELEASE: 03/14/2001

CIA-RDP86-00513R001860810011-5

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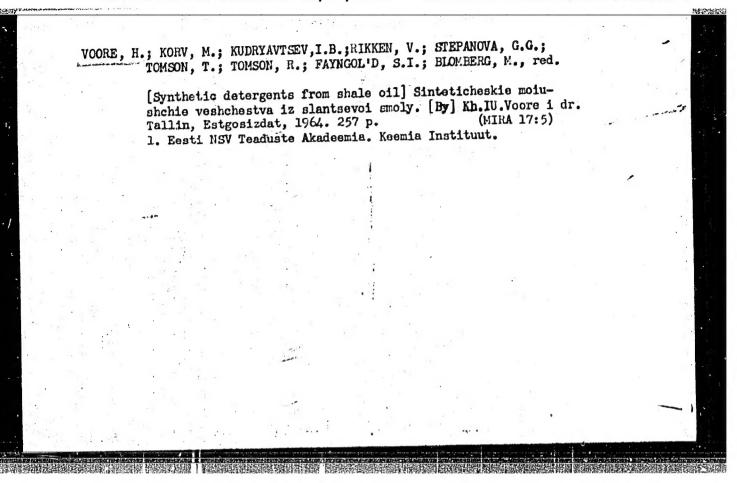
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